

Plant an Old Growth Forest Project
Dam Decommissioning Update
April 2010

Dam Planning and the Dam Working Group

The Dam Decommissioning Working Group began meeting in early 2009 to develop a plan to decommission the dam on the Ignatius Jesuit Centre Property. Here we are in early spring 2010 with a final plan for full removal of the IJC dam! Conceptual engineering drawings for the dam removal are now complete; as are plans for dewatering the pond, sediment management, and mudflat rehabilitation. Planning for fish, turtle and amphibian rescue and relocation are in the works. We are even planning to use the old concrete from the dam removal to build a snake hibernaculum near the mill ruins!

Permits applications from the Ministry of Natural Resources and the Grand River Conservation Authority have been submitted and we are awaiting approvals for the work. If all goes according to plan, we will be removing the dam in mid-summer 2010.

Planning to remove a dam is more involved than it might first appear. Dam removal is a relatively new pursuit in Ontario, and each dam has unique challenges in planning for its removal. The following is a brief discussion of the main elements involved in planning for the Marden Creek dam decommissioning at IJC.

**To remove or not to remove?
(Do we remove the dam thing or not?)**

The first decision to be made was whether or not to remove the dam. Three key factors were taken into account in making this decision. The first was the dam's age. It has already outlived the general lifespan of such structures and is therefore in need of repair or removal. The second was water quality. Dams increase water temperature, and decrease water movement, thereby decreasing levels of dissolved oxygen. Dams also cut off the downstream flow of water from its upstream source, impacting nutrient movement through waterways and causing sediment accumulation where the water is impounded. The third was habitat needs for fish and wildlife. There has been a dam at the IJC site in Marden creek for approximately 120 years, and for this time period native brook trout and other cold water species of fish have not had access to the speed river. In fact, cold water species such as native brook trout are only able to live in the higher reaches of Marden Creek, due to the higher water temperatures near the dam. The Wellington County Stewardship Council (WCSC) and the Speed Valley Chapter of Trout Unlimited Canada (TUC) have been working to restore Marden Creek to a cold water habitat that can support fish

species that have been heavily impacted by the changes that came with European settlement. In choosing to remove the dam, IJC will be part of the important work being done by WCSC and TUC to restore Marden Creek to cold, clean water all the way to the Speed River.

Taking into account all three factors, the decision was made to decommission the dam. However, once this decision was made, we then had to decide whether creek restoration and dam removal goals would best be met by a partial removal of the dam, a complete removal, or whether a bypass channel would suffice. In the end the Dam Working Group opted to remove the whole dam thing. Only a small section of concrete on the north side will remain, and it will not have any functional capacity to hold back water.

Dewatering the Pond

Before the physical removal of the dam can take place, the water in the pond has to be drawn down so that machinery can get in to break up the concrete and then remove the broken concrete and earth. Planning has to eliminate the possibility of a large gush of water being released, resulting in a rush of sediment-laden water downstream. The timing of dewatering and the manner in which the pond is dewatered have an impact on sediment management. Timing of dewatering also has to accommodate a plan for rescuing and relocating fish and turtles.

The dam Working Group has opted for a moderately slow dewatering process. The first phase of dewatering will begin in approximately mid June and will be accomplished by the construction of a small coffer dam and bypass channel at the south side of the dam. This phase of dewatering will continue until approximately mid July at which point a coffer dam will be constructed at the existing sluiceway. The remaining pond water will be drawn down by hammering out the sluiceway and gradually lowering the coffer dam.

Actual deconstruction and removal of the dam

Once the water in the pond has been lowered, a construction contractor can get down to the business of actually removing the dam, which will consist of hammering out the concrete, and relocating the earthen portion of the dam. The waste concrete will be used in the construction of a snake hibernaculum not far from the site, and the earth will be repositioned along the creek bank.

Wildlife removal and relocation

Plans are being developed for the rescue and relocation of turtles and warm water fish that currently inhabit the pond. Both painted and snapping turtles live in the pond and require different removal and relocation strategies. Volunteers will be needed for this part of the process! Keep posted for dates and times for the wildlife rescue mission.

Sediment Management

Much planning has been done to ensure that a minimal amount of sediment makes it way to the downstream environment. As water is being drawn out of the pond at a moderate rate, the exposed mud flats will be seeded with annual rye to stabilize the sediments and inhibit the growth of reed canary grass, an aggressive grass. Sediment fencing will be strategically positioned to minimize downstream movement of sediments.

Revegetation of the mudflats

The dewatering of the pond will result in about 2.5 hectares of mud flats being exposed. This same area of mud flat is exposed in extremely dry summers when the pond is reduced to a small trickle of water making its way through the flats. During these dry periods observers have noted that the mud flats 'green up' very quickly – within about 2 weeks. It is quite likely that most of this 'greening up' is from reed canary grass germinating on the exposed sediments. This plant has become quite a problem in wetlands over the last several years. It tends to suppress other native wetland vegetation, thereby causing a reduction in biodiversity. A short term restoration goal for the mudflats is to inhibit the germination of reed canary grass by broadcasting a mix of annual and perennial rye grass and oats. These fast-germinating species will help to stabilize sediments while at the same time inhibit reed canary grass. The long-term restoration goal for the mudflats is to restore it to a biologically diverse area dominated by trees and shrubs. This will ultimately create shady conditions in which canary reed grass is not as aggressive.

For an interesting research paper on reed canary grass go to:

<http://images.library.wisc.edu/EcoNatRes/EFacs/NAPC/NAPC14/reference/econatres.napc14.dspuhler.pdf>

The decommissioning of the IJC dam is a collaborative effort amongst representatives from the Wellington County Stewardship Council (WCSC), Trout Unlimited (TU), the Grand River Conservation Authority (GRCA), the Ontario Ministry of Natural Resources (OMNR) and of course, the Ignatius Jesuit Centre of Guelph (IJC). The removal of the dam and restoration of the creek are part of IJC's Plant an Old Growth Forest Project, an ecosystem level initiative to restore 40 hectares of creek and forest at the Ignatius Jesuit Centre of Guelph.